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Agricultural Engineering.

English view of American agricultural engineering. Agricultural Engineering. v. 19, no. 1. January, 1938. p. 10. Abstracted from paper on "What English and American Agricultural Engineers Can Learn from Each Other," by Claude Culpin, lecturer in agricultural engineering in the School of Agriculture, University of Cambridge, England, presented before the North Atlantic Section of the A.S.A.E. at Toronto, Canada, October 12, 1937.

Agriculture.

Agricultural outlook for Illinois 1938. Urbana, Illinois, 1937. 32p. University of Illinois. College of agriculture. Extension service in agriculture and home economics. Circular 480.

Agricultural situation and outlook 1938. Ottawa, Canada. Department of agriculture co-operating with Department of trade and commerce, 1937. 73p.

Effect of agricultural and home economics research on Oregon's agricultural progress; A report of activities and accomplishments for biennium ending June 30, 1936. Corvallis, Oregon, 1937. 85p. Oregon state college. Agricultural experiment station. Bulletin 350.

Farm outlook for 1938. Washington, U.S. Govt. print. off., 1937. 43p. United States Department of Agriculture. Miscellaneous publication 298.

Forty-ninth annual report 1936. College Station, Texas, Agricultural experiment station, 1937. 346p. Run-off water losses in relation to crop production, p.66. Mechanical harvesting of cotton, p.70-71; 156-157. Operating costs and financial conditions of gins in Texas, p. 125-126. Operating costs and financial conditions of gins in Texas, p.125-126. Factors of efficiency in the distribution and placement of cottonseed and fertilizers, p.157-159. Atmospheric exposure of wire and fencing, p.159. Prickly pear eradication, p.160. Eradication of Mesquite Brush, p.161. Wildlife research, p.161.

Golden anniversary annual report Colorado experiment station 1936-37. Fort Collins, Colo., 1937. 62p.

Streamlined agriculture. New England Homestead. v. 111, no. 1. January 1, 1938. p. 4, 13. Year 1937 witnessed record-breaking trend in the swing to speedier, more efficient farming with power equipment.

Agricultura. (Cont'd)

What's new in farm science. Part I. Annual report of the director Agricultural experiment station, University of Wisconsin. Agricultural experiment station. Bulletin 439.

Air Conditioning.

Air conditioning with ice. By C.D. Robison. Ice and Refrigeration. v. 94, no. 2. February, 1938. p.105-106. Results of an experiment in the use of ice as cooling medium for summer air conditioning of residences. Construction and operating costs.

Health aspects of air conditioning. By Brewster S. Beach. Scientific American. v. 157, no. 3. September, 1937. p. 152-155. Much research broadening base of air conditioning. Sociological, medical problems studied. Greater health, comfort, satisfaction the aim.

New tables of the psychrometric properties of air vapor mixtures. By William Goodman. Heating, Piping and Air Conditioning. v. 10, no.1. January, 1938. p. 1-7. Based upon new Keenan-Keyes steam tables. Author clarifies subject of heat balances, which is basic to all air conditioning computations.

Refrigeration storage applied to air conditioning. Part I. By W.F. Friend. Refrigerating Engineering. v. 35, no. 2. February, 1938. p. 92-96, 106. By means of refrigeration storage characteristics of air conditioning load can be substantially modified, to benefit both customer and utility company. This should assist materially in solving problem of power costs. In this paper, economic background of refrigeration storage or "hold-over" is discussed, indicating why it should be given serious consideration for important installations. Data are presented on characteristics of commercial air conditioning loads, with particular reference to cost of power supply. Methods for storing refrigeration are described, and construction details for some typical installations presented. Procedure for determining economic amount of storage to be provided in specific cases is suggested. Some refrigeration-storage systems now in operation are briefly described.

Assessment.

Some inequalities in the assessment of farm real estate in South Carolina. By G.H. Aull and Ernest Riley. Clemson, South Carolina, 1938. 56p. Clemson agricultural college. Agricultural experiment station. Bulletin 313.

Barns.

Building and remodeling dairy barns. By C.S. Rhode and W.A. Foster. Urbana, Illinois, 1937. 27p. University of Illinois. College of agriculture. Extension service in agriculture and home economics. Circular 478.

Barns. (Cont'd.)

One story barn. By S.H. Reck. Farmers Digest. v. 1, no. 9. January, 1938. p. 31. One-story dairy barn highly resistant to fire and wind hazards has been designed by agricultural engineers at University of Wisconsin and is now being constructed on three farms in that state. Construction material consists of reinforced concrete, hollow tile with brick facing, or stone. Roof is flat with 4-inch layer of rock wool or other fireproof insulation placed against rafters. Covering of roofing felt and tar is used on top. Inside is ceiled with metal lath and 1 inch of cement plaster.

Something new in dairy barn construction. By R.J. Cooley. Purdue Agriculturist. v. 32, no. 4. January, 1938. p. 48. Barn is unique because of type of material used in construction of side-wall. Walls are made of "compressed concrete" sprayed into place by a machine called "Concreter." Walls are only three inches thick, reinforced only with one-fourth inch upright steel rods spaced every four feet, and six-inch mesh woven wire fence running horizontally. Concreter mixes sand and cement in three-to-one ratio and blows the mixture by compressed air through a hose to point of application. At nozzle a water hose joins the mixture; so wetness of spray can be regulated. Thus concrete can be sprayed against smooth oily masonite board, which is removed after three inches of concrete harden on this wire skeleton.

Big Thompson Project.

Colorado-Big Thompson project argued at hearing. Engineering News-Record. v. 119, no. 21. November 18, 1937. p. 808. Use of national park area as tunnel route is attacked by conservation groups and park service.

Building Construction.

Adequate buildings at low cost. By Deane G. Carter. Progressive Farmer. v. 53, no. 1. January, 1938. p. 41.

Building fireproof. By Anna Dee Weaver. Nebraska Farmer. v. 50, no. 3. January 29, 1938. p. 6. Cross-section through wall of concrete house, showing how insulation is achieved and how frame of building is completely fireproofed.

Farmer as architect. Seattle, Washington. 1937. 5p. West Coast Lumberman's Association. Information department. Radio talk no.7. Mimeographed.

Lag-screw joints: Their behavior and design. By J.A. Newlin and J.M. Gahagan. Washington, D.C., U.S. Govt. print. off., 1938. 26p. United States Department of Agriculture. Technical bulletin no.597.

Low cost building construction in practice. By K.J.T. Ekblaw. Agricultural Engineering. v. 19, no. 1. January, 1938. p. 9-10. Use of simple, commonly available, and easily applied materials characterizes construction of small home described in this paper.

Building Construction. (Cont'd)

Mortgage insurance agreed on. Engineering News-Record. v. 120, no. 4. January 27, 1938. p. 125-126. House adopts conference version of bill to stimulate residential building construction. Bill amends Federal Housing Act to reduce cost of home ownership in low-cost market and to extend scope of F.H.A. services to large-scale housing operations.

Plastic caulking and pointing materials. Part II. Investigations. Washington, D.C., 1937. 6p. United States Department of Commerce. National Bureau of Standards. Technical information on building materials for use in the design of low cost housing. TIBM-56. Mimeographed

Building Materials.

Progress in use of treated timber. By E.E.R. Tratman. Engineering News Record. v. 120, no. 5. February 3, 1938. p. 190-191. American Wood Preservers Association considers preframing and structural timbers, the economics of treated ties and poles, and termite protection.

Scientific method in earthwork. Rule-of-thumb procedure yields to application of principles of soil mechanics in foundation problems. By Glennon Gilboy. Civil Engineering. v. 7, no. 12. December, 1937. p. 827-830. Reviews contributions of soil mechanics to design of spread foundations, pile foundations, retaining walls, and earth dams.

Weathering properties of building brick. Washington, D.C., 1937. 4p. United States Department of Commerce. National Bureau of Standards. Technical information of building materials for the use in the design of low-cost housing. TIBM-57. Mimeographed.

Camps.

Building log cabins. By Jim Emmett. American Builder and Building Age. v. 59, no. 8. August, 1937. p. 49-52.

"Travel" camps in the Ozarks. By Allen S. James. National Petroleum News. v. 29, no. 31. August 4, 1937. p. 37-39.

Canals.

Consideration of slopes of flow in design and maintenance of artificial channels. By Radha Krishna Khanna. Indian Engineering. v. 102, no. 6. December, 1937. p. 213-214.

Finishing the all-American canal. By R.G. Skerrett. Scientific American. v. 157, no. 3. September, 1937. p. 144-146. New canal replaces old one that goes partly through Mexico: Water for two rich agricultural valleys. A monumental undertaking.

Canals.

Machines and methods for canal construction, Colorado river aqueduct. By W.L. Chadwick and G.E. Archibald. Civil Engineering. v. 8, no.2. February, 1938. p. 104-108. Deals with construction of open canal, with special attention to design and operation of huge machines developed by contractors for trimming subgrades and for placing concrete.

Central Valley Water Project.

Progress on Central Valley Project. Engineering News-Record. v. 120, no. 3. January 20, 1938. p. 109-112. Start on Contra Costa Canal initiates $170,000,000 project to safeguard California against drought.

Conservation.

Balancing our resources' budget. By Harold L. Ickles. Reclamation Era. v. 27, no. 11. November, 1937. p. 257-258.

Basin listing to retain snow moisture. By V.H. Florell. Soil Conservation. January, 1938. p. 194-195. Specific objective was to compare effectiveness of basin listing with that of ordinary listing, and to contrast results from these methods with those obtained on untreated fields previously used for grain and row crops where wind strip cropping is practiced.

Science and rural life. By Morris Llewellyn Cooke. Farmers' Digest. v. 1, no. 9. January, 1938. p. 1-6. To accomplish anything substantial in establishing controls over soil and water we need first far-flung educational campaign to bring our people to realization of fact that, unless active steps are taken immediately, large sections of country will become agricultural shambles within lifetime of some of those now living. Best brains in the land are needed to formulate the problem, i.e., to decide how far we need to go in stabilizing our soils and conserving our waters, and to outline necessary steps for reasonable accomplishment of stated objective by predetermined data.

Soil conservation districts. Dakota Farmer. v. 57, no. 22. October 23, 1937. p. 556. How these legal units are operated under Dakota laws.

Soil conservation in the Texas Blacklands. By H.O. Hill. Civil Engineering. v. 8. no. 2. February, 1938. p. 109-112. Enormous tolls are taken from farm lands each year by water and wind erosion, whose effects are reflected not only in soil depreciation and smaller crop yields, but also in reduced reservoir capacities resulting from silting. Such losses as these are nevertheless largely preventable. Among methods of control found most effective on that project are terracing; strip cropping, both with and without terracing; pasture furrowing or ridging; and gully control by means of erosion check dams and vegetation. Many of the methods developed for use in the Texas blacklands are equally applicable to similar areas in other parts of the country.

Corrosion.

Effect of oxygen on corrosion of steels. By Frank G. Frese. Industrial and Engineering Chemistry. v. 30, no. 1. January, 1938. p. 83-85. Stainless steel tested under different oxygen pressures in distilled water, in neutral sodium chloride solutions, and in mixture of sodium chloride and hydrochloric acid, and mild steel under different oxygen pressures in distilled water, show a maximum rate of corrosion below one atmosphere oxygen pressure. At oxygen pressures above those represented by the maxima, the corrosion rate rapidly decreases. This behavior is explained on the assumption of formation of more protective film at high oxygen pressures. That more protective film was probably formed was evidenced by observation with mild steel in distilled water, that as corrosion rate decreased from maximum, corrosion products became hard and compact. The corrosion rate of stainless steel in sodium chloride solution rose with increased salt concentration. This was probably due to the well-known film-destroying action of chloride ion, the action increasing with rise of salt content. Corrosion rate of mild steel in 3.5 per cent sodium chloride solution was roughly proportional to oxygen pressure.

Corrosion of ferrous metals in house construction. Washington, D.C., U.S. National Bureau of Standards, 1938. 7p. Technical information on building materials, TIBM-60. Mimeographed.

Corrosion probability. By R.B. Mears and R.H. Brown. Industrial and Engineering Chemistry. v. 29, no. 10. October, 1937. Industrial edition. p. 1087-1091. Bibliography. Effect of several external variables on corrosion probability and intensity of attack for aluminum specimens has been investigated. Increase in area of metal increases probability that attack will develop somewhere on specimen but decreases number of breakdowns per unit area. Average depth of attack increases to maximum value when 4 sq. cm. of metal is exposed. When number of points of attack on specimen is increased, average depth of attack decreases. Increase in temperature of experiment increases probability of attack but decreases average depth of attack. With increase in sodium chloride concentration, probability of attack and average depth of attack both increase. At critical potential, attack of aluminum cathodes immersed in either sodium or aluminum chloride solutions can be prevented. However, at higher or lower applied potentials, attack occurs. Results indicate that attack of aluminum in chloride solutions is at least partially electrochemical in nature. Statistical analysis of data indicates that number of weak places in film on aluminum increases as their size or intensity decreases. Frequency distribution curve for specimens containing various numbers of points of attack differs from curve that would be obtained, if occurrence of one pit did not influence occurrence of other pits, in manner to be expected from corrosion theory.

Cotton.

Growth and structure of cotton fiber. By Donald B. Anderson and Thomas Kerr. Industrial and Engineering Chemistry. v. 30, no.1. January, 1938. p. 48-54.

Cottom Machinery.

Engine heat for cotton driers. By Cas. A. Bennett and Victor L. Stedronsky. Cotton Ginners' Journal. v. 9, no. 4. January 1938. 5-6, 18.

Dairy Farm Equipment.

Fattening cattle in Washington. By Con S. Maddox. Pullman, Washington, 1937. 15p. State college of Washington. Extension service. Bulletin 238.

Dams.

Dakota's dams imprison valuable run off. Dakota Farmer. v. 58, no.2. January 15, 1938. p. 22-23. Ocean does not get Dakota water held back by more than 2,000 dams.

Dam construction in progress at the beginning of 1938. By W.I. Swanton. Reclamation Era. v. 28, no. 1. January, 1938. p. 8-10.

Recreation dam build in Miami reservoir. By C.H. Eiffert. Engineering News-Record. v. 120, no. 4. January 27, 1938. p. 137-139. Low concrete dam, submerged in time of flood by backwater from flood-control dam, creates attractive ponds in Englewood Reserve.

Siphon spillway. By K.D. Joshi. Indian Engineering. v. 101, no.4. April, 1937. p. 124-130. Paper prepared in order to illustrate how siphon spillway could very easily be adopted in case of high masonry dam, and how different parts of siphon could be designed to suit peculiar circumstances of a narrow masonry dam.

Stock water in Western South Dakota; Approximate location of stock water and irrigation dams in Western South Dakota. Brockings, S.Dak. South Dakota State planning board, 1937. 18p. Mimeographed.

Diesel Engines.

General Motors new Diesel program. Power Plant Engineering. v. 42, no. 2. February, 1938. p. 144-145. Complete line of light-weight two-cycle engines from 55 to 1200 hp. to be produced in these factories. New Detroit factory now producing Model 71 series, in one to six cylinders, 55 to 160 hp. maximum of 1800 r.p.m. Cleveland factory will produce Model 223 series, four to eight cylinders, 200 to 400 hp. and newLaGrange factory present line of engines ranging from 600 to 1200 hp. Development work will be centralized in new Detroit laboratory.

Keeping Diesels fit. By J. Wyllie Keck. Southern Power Journal. v. 56, no. 2. February, 1938. p. 50-53. Inspection and maintenance procedure.

Drainage.

Comments on National Resources Committee report "Drainage basin problems and programs". By J.P. Cain. Bismarck, N.Dak., North Dakota state planning board. 1937. 21p. Mimeographed.

Concrete pipe drainage structures for highways and railroads. Prepared and edited by M.W. Loving. Chicago, Ill., 1937. 72p. American Concrete Pipe Association. Bulletin 16.

Earthwork, drainage volume lower. Engineering News-Record. v. 120, no. 4. January 27, 1938. p. 127. This class of construction represents 4.5 percent of U.S. total; volume shifts from South to West of Mississippi. Earthwork, irrigation and drainage construction in U.S. totals $110,353,000 for 1937, drop of 39 percent from $181,685,000 reported in 1936.

Droughts.

Plant behavior in drought. By Wilbur W. Weed. Reclamation Era. v. 27, no. 11. November, 1937. p. 260-263.

Electric Wiring.

1937 National electrical code: Regulations of the National board of fire underwriters for electric wiring and apparatus as recommended by the National fire protection association. New York, N.Y. National board of fire underwriters, 1937. 334 p.

Electricity-- Distribution

Developing load on existing rural lines. By E.C. Easter. Electrical World. v. 109, no. 5. January 29, 1938. p. 38-40, 93. Problem presented by farms adjacent to rural lines, but not taking service, has been solved by the Alabama Power Company.

Evolution of rural distribution. By John McCombe. Electrical Times. v. 92, no. 2409. December 23, 1937. p. 854.

Local farmers aid Arkansas utility to construct rural electric lines. Electrical World. v. 109, no. 4. January 22, 1938. p. 359. Added cost with farm labor is about 3 percent, but plan enables customers to pay house wiring and other costs. New type line cuts cost considerably.

Michigan farmers get benefits in rural electrification race. Electrical World. v. 109, no. 5. January 29, 1938. p. 51. More than 50 percent of farms in State now receive electric service. Total number of farms served has increased in last ten years from 11,600 to estimated 82,500. REA program target of Farm Bureau.

Progress of rural electrification in Indiana. By M.J. Briggs. Hoosier Farmer. v. 23, no. 1. January, 1938. p. 19, 33.

Electricity in the Home.

Progress in domestic use of power. Electric Journal. v. 35, no. 1. January, 1938. p. 32-33.

Electricity on the Farm.

Electrification extension schools for rural people. By Albert V. Krowatch. Paper presented before the North Atlantic Section meeting of the American society of agricultural engineers, October 13, 1937. College Park, Maryland, University of Maryland, 1937. 9p. Mimeographed.

Greenhouse kilowatts. By Neal D. Herrick. Rural Electrification Exchange. v. 1, no. 1. January, 1938. p. 17-19. Partial list of commercially practical greenhouse uses would include following: 1. Motor stokers. 2. Oil burners. 3. Boiler feed water return. 4. Water for irrigation purposes. 5. Refrigeration. 6. Propagating benches. 7. Frost prevention - Hotbeds and sash houses. 8. Plant lighting. a. Forcing growth. b. Retarding growth. 9. Insect control. a. Stationary spray plants. b. Insect light traps. 10. Soil shredders. 11. Soil sterilization. 12. Portable tools. a. Drill. b. Saw. c. Paint sprayer. 13. Paint mixer. 14. Fuel oil preheater. 15. Forced draft for hand-stoked boilers.

Modern methods in electric brooding. By J.C. Scott. Rural Electrification Exchange. v. 1, no. 1. January, 1938. p. 1-4.

1937 Report of Rural electrification administration. Washington, D.C., U.S. Govt. print. off., 1938. 135p.

Engines.

Winter gas engine troubles. By Forrest Wright. American Agriculturist. v. 134, no. 25. December 4, 1937. p. 8. Timing the ignition.

Erosion Control.

Torrential flood erosion in the Connecticut Valley, March, 1936. Robert F. Collins and Marshall Schalk. American Journal of Science. v. 34, no. 202. October, 1937. p. 293-307.

Unmaking a continent. By H.H. Bennett. Address before the Brooklyn Institute of Arts and Sciences, Brooklyn Academy of Music, April 22, 1937. Washington, D.C., United States Department of Agriculture. Soil Conservation Service, 1938. 18p. Mimeographed.

Farm Buildings.

Analysis of farm structures market. By G.B. Hanson. Agricultural Engineering. v. 19, no. 1. January, 1938. p. 17-20. Importance of farm structures market; Effect of new agricultural trends; Factors influencing the volume of farm building.

Farm Buildings. (Cont'd)

Farmers grain elevators; Factors influencing their successful operation. By L.J. Norton. Urbana, Illinois, 1937. 18p. University of Illinois. College of agriculture. Extension service in agriculture and home economics. Circular 476.

Hospitals for rural communities. By Blanche Halbert. Washington, U.S. Govt. print. off., 1937. 42p. United States Department of Agriculture. Farmers' Bulletin no. 1792.

Farm Chemurgic Council.

New customers for southern farms. By D. Howard Doane. Southern Agriculturist. v. 67, no. 7. July, 1937. p. 5, 21. South seems to be promised land of farm chemurgic movement, for it can furnish wide variety of crops like cotton, peanuts, potatoes and soybeans.

Farm Income.

Costs reduce gain in farm income. By C.M. Purves. Agricultural Situation. v. 22, no. 1. January 1, 1938. p. 9-11. Total cash income of farmers in 1937, estimated at $8,500,000,000, was $580,000,000, or 7.3 per cent more than in 1936. It was nearly twice as large as the $4,328,000,000 received in 1932. But it was much below the $10,479,000,000 received in 1929, which was largest income in 14 years of record, back to 1924. Estimates of cash incomes are summation of monthly estimates made during calendar year of income from farm marketings and from Government payments. They are designed to eliminate duplications that occur where crops and livestock products are valued separately, and no allowance is made for crops used for seed, fed to livestock, or used for food on farms where produced. Estimates indicate amount of money available to farmers for paying taxes and interest and for purchasing commodities and services used in operating their farms, and in supporting their families. However, effect of changes in prices of purchased commodities and services upon the farmers' welfare is nearly as great as changes in income.

Relative income from farming in 1937. By W.F. Callander. Agricultural Situation. v. 22, no. 1. January 1, 1938. p. 8. Reports disclosed low relative income throughout the drought area. Income averaged less than 25 percent of "usual" in large areas in western North Dakota and northwestern Montana, where most crops failed in 1936 and 1937, where farmers have had little income except that obtained from the sale of breeding flocks and herds. Reports averaged low in some sections where incomes were sharply reduced last fall by low prices of potatoes, apples, cotton and some other cash crops. But they averaged more than 100 percent in some western range areas, and some eastern bluegrass areas, where the income of farmers is derived almost entirely from sales of livestock and livestock products. Survey is experiment in effort to secure more information from crop

Farm Income. (Cont'd)

correspondents regarding general agricultural conditions in their respective localities. It is quite probable that their judgment regarding such matters as general crop prospects, local feed supplies, and farm income will be found valuable as their reports regarding condition of individual crops.

Farm Labor.

Graphic summary of farm labor and population. (Based largely on the census of 1930 and 1935.) By J.C. Folsom and O.E. Baker. Washington, U.S. Govt. print. off., 1937. 48p. United States Department of Agriculture. Miscellaneous publication no. 265.

Farm Machinery and Equipment.

California forecasts fewer farm hands - more machines. By F. Hal Higgins. Farm Implement News. v. 59, no. 2. January 29, 1938. p. 25-27.

Care of machinery saves farmer money. Idaho Farmer. v. 55, no. 24. November 25, 1937. p. 8. Good care for farm machinery calls for protection from weather by housing, protection of parts to ruse or decay, and repairing, adjusting and replacement of parts.

Farm equipment. By Douglas Gray. New Jersey Farm and Garden. v. 8, no. 12. December, 1937. p. 20.

Farm tools' new "Speedisk." Farm machinery & Equipment. no. 1849. January 15, 1938. p. 26. Company develops disk harrow for modern tractor use.

Implements and methods of tillage to control soil blowing on the northern Great Plains. By John S. Cole and George W. Morgan. Washington, D.C., U.S. Govt. print. off., 1938. 20p. U.S. Department of Agriculture. Farmers' bulletin no. 1797.

Machine grades and cleans potatoes. Idaho Farmer. v. 55, no. 24. November 25, 1937. p. 8.

Machines now do more for family size farm. Farm Machinery & Equipment. no. 1849. January 15, 1938. p. 36.

Machines now do more for family-size farms, says McCrory. Farm Implement News. v. 59, no. 1. January 13, 1938. p. 45.

Make the listers work. By L.W. Hurlbut. Implement & Tractor. v. 53, no. 3. February 5, 1938. p. 32, 36.

New mechanical technique to develop vegetative cover. By F.E. Hardisty, G.F. Delong and R.L. Delvin. Agricultural Engineering. v. 19, no. 1. January, 1938. p. 11-12, 16. New mechanical methods for quick development of vegetative cover that have been on trial by Soil

Farm Machinery and Equipment. (Cont'd)

Conservation Service at its Athens, Georgia, demonstration project are expected to prove valuable to farmers of Southeastern States wherever they are organized for community effort in use of heavy farm machinery. Application of these methods on the Athens project has improved the technique of establishing meadow strips, of converting existing gullies and abandoned road rights-of-way to vegetative terrace outlets, in constructing vegetative terrace outlets on steep grades, and in developing pasture cover on badly eroded and gullied land. They consist chiefly of combination of subsoiling to a depth of approximately 18 inches mechanical sowing of grass sprigs or propagation of cover from seed, and mechanical mulching by means of manure spreader. Erosion-control effects of subsoiling, though temporary, stimulate development of vegetative cover while simultaneously providing temporary storage in soil for runoff water. Thus subsoil treatment serves tow desirable functions until vegetative cover has developed sufficiently to carry the burden. New methods are equally effective when practiced with ordinary farm equipment, but are necessarily slower when light equipment is used. Equipment needed to perform any of this work on a construction scale consists of one 40 hp. track-type tractor, one-wheel-type terracing machine, one 3-tooth subsoiler, one manure spreader, and one heavy tractor disk.

New wonders of next year's farm machines. By Harry G. Davis, Southern Agriculturist. v. 67, no. 11. November, 1937. Preview of farming equipment adapted to the South. (p. 26-27.)

Studies on the relation between cultivation implements, soil structure and the crop. III. Rolls: An account of methods employed in a study of their actions on the soil. By C. Culpin. Journal of Agricultural Science. v. 27, p. 432-446. July, 1937. Paper deals mainly with methods which have been used to determine effects of rolls on soils in laboratory, and with application of some of these methods to field experiments.

Tests of tillage tools. By John W. Randolph and I.F. Reed. Agricultural Engineering. v. 19, no. 1. January, 1938. p. 29-33. II. Effects of several factors on the reactions of fourteen-inch moldboard plows.

Farm Tenancy.

Proposed adjustments in the farm tenancy system in Missouri. By John H. Dickerson. Columbia, Missouri, 1937. 63p. University of Missouri. College of Agriculture. Research bulletin 270. Bibliography, p.49-50.

Fences.

Old inner tubes used in low-cost fence post treatment. Madison, Wisconsin, Forest products laboratory, 1937. 2p. Mimeographed.

Fences. (Cont'd)

Touch me not. By Arnold Nicholson. Country Gentleman. v. 107, no. 11. November, 1937. p. 20-21, 72-73. Discussion of electric fencing.

Fire Protection.

Fire! The swift destroyer. By J.E. Stanford. Southern Agriculturist. v. 67, no. 11. November, 1937. p. 50.

Safe use and storage of gasoline and kerosene on the farm. Issued by the Bureaus of Chemistry and Soils, Agricultural Engineering and Agricultural Economics, in cooperation with the National Fire Protection Association. Washington, Govt. print. off., 1938. 14p. United States Department of Agriculture. Farmers' bulletin no. 1678.

Flax.

South Texas may produce the nation's flax. By Frank A. Briggs. Farm and Ranch. v. 56, no. 21. November 1, 1937. p. 4, 13.

Floods and Flood Control.

Appraisal of unit-graph method of flood estimation. By C.R. Pettis. Civil Engineering. v. 8, no. 2. February, 1938. p. 114-115.

Floods and flood control. By Theodore T. Knappen. Engineering News-Record. v. 120, no. 6. February 10, 1938. p. 239-241. Year marked by great Ohio River flood, and first test of Mississippi control system saw much progress in studies and construction.

Major Texas floods of 1936. Washington, D.C., Govt. print. off., 1937. 146p. United States Geological Survey. Water-supply paper 816.

National aspects of flood control. A symposium: Discussion. By Ralph W. Powell. American Society of Civil Engineers. Proceedings. v. 64, no. 1. January, 1938. p. 180-182.

Floors.

Adhesives for floor coverings. Washington, D.C., 1937. 10p. United States Department of Commerce. National Bureau of Standards. Technical information on building materials for use in the design of low-cost housing. TIBM - 53.

Concrete feeding floor. By G.B. Hanson. Farmers Digest. v. 1, no.8. December, 1937. p. 57-59. Important savings in production costs have convinced many feeders that concrete feeding floor increases their margin of profit considerably. Those sayings are: First, saving in feed since no feed can be trampled down into mud where it is lost to the cattle. In second place, concrete floor saves greatly on bedding which is on many farms very important item; third, saving of importance is on labor required to feed and care for cattle.

Floors. (Cont'd)

Relative resistance of floor covering materials to abrasion. Washington, D.C., 1937. 4p. United States Department of Commerce. Technical information of building materials for use in the design of low-cost housing. TIBM-54. Mimeographed.

Resistance of floor covering materials to staining and chemicals. Washington, D.C., 1937. 5p. United States Department of Commerce. National Bureau of Standards. Technical information on building materials for use in the design of low cost housing. TIBM-52. Mimeographed.

Flow of Water and Gases.

Mechanics of turbulent flow; Lectures delivered under the William Pierson Field Foundation at Princeton University, February, 1935. By Boris Bakhmeteff. Princeton, Princeton University press, 1936. 101p.

Heating.

Directory section heating, piping and air conditioning equipment for industry and large buildings. Heating, Piping and Air Conditioning. v. 10, no. 1. January, 1938. p. 231-294.

Fundamentals of fuel oil combustion. By E.G. Roberts. Power Plant Engineering. v. 42, no. 2. February, 1938. p. 111-114. From burner to gas passes, burning of fuel oil takes place in several chemical steps with explosion-like rapidity, each elementary step being fundamentally necessary for complete combustion.

Gravity warm-air heating. Edited by James D. Hoffman. Columbus, Ohio, National warm-air heating and air conditioning association, 1936. 516p. Digest of research, Engineering experiment station, University of Illinois.

New steam tables enthalpy - defined and discussed. By J.H. Pound. Southern Power Journal. v. 56, no. 2. February, 1938. p. 67-68. Considerable difference exists between the steam tables used ten years ago and the most recent versions covering higher pressures. Certain facts and history concerning evolution of the new tables are of particular interest.

Hops.

Electricity for hop drying. Rural Electrification and Electro-Farming. v. 13, no. 151. December, 1937. p.109.

Quicker hop drying. Electrical Review. v. 121, no. 3136. December 31, 1937. p. 922. With aid of electricity process of drying hops has been speeded up by about 75 percent.

Houses.

Business center in the home. By Jessie D. Hinton. College Park, Md. 1938. 6p. University of Maryland. Extension service. Circular 126.

Standards for small homes - to protect property values, stimulate building, improve housing. By Howard P. Vermilya. Industrial Standardization. v. 9, no. 1. January, 1938. p. 12-16.

Hydraulic Rams.

This hydraulic ram is made from pipe fittings. By C.A. Crowley. Popular Mechanics. v. 68, no. 3. September, 1937. p. 473-477. Part II. Design, construction and installation of rams.

Hydraulics.

Hydraulic knowledge. By J.C. Stevens. Engineering News-Record. v. 120, no. 6. February 10, 1938. p. 236-238. Better theory is evolving in hydrology and hydraulics, and gains are realized in model study.

Hydrology.

Hydrologic research. By Robert E. Horton. Science. v. 86, no.2241. December, 1937. p. 527-530.

Hydroponics.

Nutrient solution methods of greenhouse crop production. By R.B. Withrow and J.P. Biebel. LaFayette, Indiana, 1937. 16p. Purdue University. Agricultural experiment station. Circular no. 232. "Selected literature": p. 16.

Insect Control.

Controlling Colorado potato pests. By Leslie B. Daniels. Fort Collins, Colo., 1937. 35p. Colorado State College. Colorado experiment station. Bulletin 437.

Insulation.

Air conditioning - Insulation. By J. Ralph Dalzell and James McKinney. Chicago, Ill., American Technical Society, 1937. 301p. Treats of the principles and applications of insulation as used to retard heat losses and gains, and to guard against fire, sound, vibration, condensation, and termites in buildings.

Durability of some loose fill and aluminum foil insulating materials. Washington, D.C., U.S. National Bureau of Standards, 1938. 6p. Technical information on building materials. TIBM-59. Mimeographed.

Facts about insulation and brick walls. Brick and Clay Record. v. 92, no. 1. January, 1938. p. 56, 58.

Insulation.

Nearly every home wastes fuel. Idaho Farmer. v. 55, no. 24. November 25, 1937. p. 6. Three ways in which heat is lost from building. First, by direct transmission through walls, windows and doors. Second, by passage of warm air out through flues or ventilating ducts. Third, by filtering in of cold air around windows, doors or through cracks in walls. Heat loss through square foot of window is four times as great as through square foot of wall or ordinary wood construction. One can reduce this loss, as well as loss from air infiltration around poorly fitting windows, by using double windows or tightly fitting storm sash. If you do not use storm sash, weather stripping is next best thing. Doors require same treatment as windows.

Irrigation.

Also one-third is ill-watered. By John C. Page. Reclamation Era. v. 28, no. 1. January, 1938. p. 2-4.

Border method of irrigation. By Samuel Fortier. Washington, D.C., U.S. Govt. print. off., 1937. 22p. United States Department of Agriculture. Farmers' bulletin no. 1243.

Irrigation in North Dakota. Bismarck, N. Dak., North Dakota State planning board, 1937. 111p. Mimeographed.

Irrigation of field crops on the Great Plains. By Leslie Bowen. Agricultural Engineering. v. 19, no. 1. January, 1938. p. 13-16. During past five years, U.S. Department of Agriculture, through its Bureaus of Agricultural Engineering and Plant Industry, at Scottsbluff Field Station in western Nebraska, has been conducting field experiments on (1) use of water by field crops under irrigation, and (2) efficiency of irrigation practices. This work is being accomplished by accurately measuring all water applied, both irrigation and rain, to various crops, and by intensive soil sampling for moisture determinations.

Irrigation systems and their application. By J.P. Schaenzer. Agricultural Engineering. v. 19, no. 1. January, 1938. p. 21-22. Revolving sprinklers. Low pressure perforated sprinkler pipe. Eyelet hose. Overhead sprinkler pipe system. Surface irrigation. Porous hose irrigation.

Landwirtschaftliche verwertung städtischer abwässer. By Carl Stein Berlin, Julius Springer, 1937. 114p.

Life restored to Pecos Valley agriculture. By Esther L. Nelson. Farm and Ranch. v. 56, no. 21. November 1, 1937. p. 6, 16.

Organization and operation of cooperative irrigation companies. By Wells A. Hutchins. Washington, D.C., 1936. 54p. U.S. Farm Credit Administration. Cooperative division. Circular no. C-102. "Selected references". p. 52-54.

Irrigation. (Cont'd)

Supplemental irrigation in the humid region. By F.E. Staebner. Market Growers Journal. v. 62, no. 1. January 1, 1938. p. 24-25.

Land Utilization.

Land classification for land use planning in the Great Lakes cut over region as illustrated by Forest county, Wisconsin. By William F. Musbach, Collaborator. Washington, D.C., 1937. 24p. United States Department of Agriculture. Bureau of Agricultural Economics. Land economics reports no. 1. Processed.

Study of farm layout in Indiana. By E.C. Young and F.V. Smith. LaFayette, Indiana, 1937. 30p. Purdue University. Agricultural experiment station. Bulletin no.423.

Levees.

Levees in lower Mississippi valley. Spencer J. Buchanan. Proceedings of American Society of Civil Engineers. v. 63, no. 7. September, 1937. p. 1304-1321. A levee may be defined as earth embankment along margin of stream to restrain its flow within desired course during flood stages. System of levees, as it exists today, in lower Mississippi Valley, is one of man's greatest works, involving approximately 761,000,000 cubic yards of material throughout its length of 1,615 miles. Type used is similar in many respects to modern earth dams. In fact, it is natural that there should be close similarity because a levee is merely an earth dam of great length, designed to function during relatively short intervals, after long lapses of time. Paper is concerned with general features considered in design of levee and use of relatively new tool, Soil Mechanics, in solving unusual problems arising in connection with levee design.

Lighting.

Lights increase profits. By Ralston R. Hannas. Farmers Digest. v. 1, no. 7. November, 1937. p. 15-20.

Poultry house lighting and its influence on egg production and chicken growth. By E.L. Dakan. Rural Electrification Exchange. v. 1, no.1. January, 1938. p. 13-15. Tests carried on at Ohio State University.

This well-lighted home is complete electrically. By W.I. Knapp. Magazine of Light. v. 7, no. 1. January, 1938. p. 12-14.

Lightning.

Lightning rods. By A.G. Tyler. St. Paul, Minn., 1938. 1p. University of Minnesota. Extension division. Agricultural engineering news letter. no. 70.

Protection against lightning. By T.C. Gilbert. Electrical Times. v.92, no.2408. December 16, 1937. p. 822-824. Detailed review of modern practice in protection of buildings against lightning strokes,

Lightning. (Cont'd)

based on statutory rules and regulations. Part I. General considerations; conductors, and aerial terminals.

Protection against lightning. By T.C. Gilbert. Electrical Times. v. 92, no. 2409. December 23, 1937. p. 857-858. Part II. Earth connections and earth resistance.

Protection against lightning. By T.C. Gilbert. Electrical Times. v. 92, no. 2410. December 30, 1937. p. 899-900. Detailed review of modern practice in the protection of buildings against lightning strokes, based on statutory rules and regulations Part III.- Buildings; oil tanks; and livestock.

Protection against lightning. By N.V. Pestereff. Electrical Review. v. 121, no. 3136. December 31, 1937. p. 926-927. Application of various types of arresters to transformers and generating plant is studied.

Lubrication.

Motor lubricants of "tomorrow". By Arch L. Foster. National Petroleum News. v. 30, no. 2. January 12, 1938. p. 94, 96-97. Future lubricant will be "assembled" oil, made up of concentrated natural and synthetic products, combined with additives which help to obtain accentuated properties which will be necessary to service greatly increased speeds, temperatures and pressures in automobiles to come.

Miscellaneous.

Blasters' handbook: Describing practical methods of using explosives for various purposes. Prepared under the direction of Arthur LaMotte. Wilmington, Delaware. E.I. Du Pont De Nemours & Company, Inc., 1938. 281p.

Engineers and economics. By W.W. Horner. Civil Engineering. v. 8, no. 2. February, 1938. p. 83-84.

How to pick long life galvanized goods. By K.J.T. Ekblaw. Better Farm Equipment and Methods. v. 10, no. 4. December, 1937. p. 16. Galvanized supplies selected with care that farmers use in buying stock and feed, can save them many dollars and much trouble.

Making an ice skating rink. Pullman, Washington, 1937. 3p. State college of Washington. Extension service. Bulletin 237.

Noise inspection and noise rating of mechanical equipment. By Ernest J. Abbott. Refrigerating Engineering. v. 35, no. 2. February 1938. p. 97-100.

Report of the Chief of Engineers U.S. Army 1937. Washington, U.S. Govt. print. off., 1937. 2v.

Miscellaneous. (Cont'd)

Statistical methods. By George W. Snedecor. Ames, Iowa. Collegiate press, inc., 1937. 341p.

A study of the weather in Washington, D.C. By Mary O. Soroka. Heating & Ventilating. v. 34, no. 9. September, 1937. p. 52-56. Presents information on weather in one large city in some detail, and this information is presented here with hope that engineers having such data may be moved to publish similar information for other important cities.

Stumpage and log prices for the calendar year 1936. Compiled by Henry B. Steer. Washington, D.C., 1937. 59p. United States Department of Agriculture. Statistical bulletin no. 62.

Technological planning. By Ralph E. Freeman. Mechanical Engineering. v. 59, no. 12. December, 1937. p. 930, 942.

Why a Public-Works Department? By Alonzo J. Hammond. Engineering News-Record. v. 119, no. 20. November 11, 1937. p. 779-780. Public benefits from centralization of public-works engineering and construction undertaken by Federal Government have long been recognized by engineers and other students of public administration. Reasons in favor of such a department are set forth.

Mississippi River.

Stages and discharge observations lower valley of the Mississippi river January 1 to June 30, 1937. Vicksburg, Miss. Mississippi river commission, 1937. 53p. War Department. Corps of Engineers, U.S. Army.

Motors, Electric

Electric motors. By B.P. Hess. Farm Machinery & Equipment no. 1849. January 15, 1938. Their selection and control for farm use. KWH consumption of electric motors on various farm jobs.

Protection of motors. By D. Rudd. Electrical Times. v. 92, no.2410. December 30, 1937. p. 889-890. I - Fuses; thermal; and magnetic releases.

Ohio River.

Economics of the Ohio River improvement. By C.L. Hall. Proceedings of American Society of Civil Engineers. v. 63, no. 8. October, 1937. Part 1. p. 1485-1510. Brief Descriptions of improved Ohio River are given including methods used in navigating it, and character of freight borne upon it. Problem presented is stated, namely, is public compensated for heavy national expenditures on improvement? Commercial navigation costs are determined as accurately as possible, on tonnage basis, for each class of freight. Government costs are

Ohio River. (Cont'd)

analyzed on ton-mile basis, applicable to all classes of freight. Sum of these two costs is compared with rail rates for various commodities, both analytically and graphically. Conclusion is reached that public has been compensated for its expenditures on Ohio River improvement, and that this fact tends to become more and more evident every year.

Paints and Painting.

Drying on linseed oil paint. By Douglas G. Nicholson and Charles E. Holley, Jr. Industrial and Engineering Chemistry. v. 30. no. 1. January, 1938. p. 114-116. A method has been devised by which it is possible to follow changes in weight of paint films while out of contact with air. There is limiting drier concentration above which no further appreciable acceleration of drying is obtained. High drier concentration produces more rapid initial drying than low concentration, although rapidity of weight gain falls off more rapidly when high concentrations are used. In cases of cobalt naphthenate and cobalt resinate the rate of gain in weight depends upon concentration and not upon anion of drier material. Film of linseed oil pigmented with titanium dioxide changes in weight much more slowly than does unpigmented oil (using equal drier concentrations.)

Raw materials for the paint industry from the farm. By Dr. Wm. J. Hale. Paint, Oil and Chemical Review. v. 99, no. 23. November 11, 1937. p. 27-29.

Plumbing.

Plumbing engineering for architects, engineers, plumbers, building superintendents, students and others interested in the sanitation of buildings and their surroundings. By Walter S.L. Cleverdon. New York, Pitman publishing corporation, 1937. 445p.

Poultry Houses and Equipment.

Dry, comfortable poultry houses. By A.O. Braeger. Farmers' Digest. v. 1, no. 8. December, 1937. p. 14-16.

Electric brooders are profitable. By Leo Kennedy. Rural Electrification News. v. 3, no. 5. January, 1938. p. 9.

Poultry management in subtropical, semiarid climates. By Burt W. Heywang. Washington, D.C. U.S. Govt. print. off., 1937. 20p. United States Department of Agriculture. Circular no. 446.

Power Development.

Chemistry of combustion. By F.W. Ellis. Southern Power Journal. v. 56, no. 2. February, 1938. p. 62-66. Tables required for making combustion calculations are presented in detail and most of the problems confronted in combustion work in the power plant field are illustrated by selected examples completely worked out.

Public Health. (Cont'd)

Safeguarding rural health. By K.E. Miller. Southern Agriculturist. v. 67, no. 11. November, 1937. p. 5. Outline of program for promoting the health of farm people.

Reclamation.

Status of major projects. Engineering News-Record. v. 120, no. 6. February 10, 1938. p. 218-226. Brief reports of progress made during 1937 on large construction projects in the civil engineering field with notes as to work remaining to be done.

Red River of the North.

Red River valley of the North plan reported by Resources Committee. Engineering News-Record. v. 120, no. 3. January 20, 1938. p. 113. Report presents plan and detailed program of water development and contains water conservation plans for watershed, which drains three states party to agreement. It includes projects ranging in size from small dams and lake improvements to relatively large reservoirs and municipal water supply works. It has been determined that major water problem of area is conservation of run-off in lakes and reservoirs and its release to stream channels at rate which will provide, at principal cities, dependable supply of water of good quality; abatement and prevention of stream pollution is essential part of plan.

Refrigeration.

Automatic control appliances: Symposium. Cold Storage and Produce Review. v. 40, no. 475. October 21, 1937. p. 242-244. Application of automatic control appliances. By C.M. Brain. Modern methods of control. By C.W. Barrett. Sarco temperature regulator. By W. Stanley Crosier. Thermometer controllers. By L.B. Lambert. Milk cooler control. By J. J. Fraser. Temperature operated controls. By F. Fields.

Automatic controls: Results obtained from their modern application. By W.E. Zieber. Ice and Refrigeration. v. 94, no. 2. February, 1938. p. 114-118. Practical engineer must understand and use to advantage the application of automatic controls, to be able to recognize and correct defective performance. An N.A.P.R.E. controls, to be able to recognize and correct defective performance.

Extended surface cooling units. By R.H. Swart. Refrigerating Engineering. v. 35, no. 2. February, 1938. p. 107-115. Design calculations.

Perpetual flame fed only by water. By Neil Hitt. Refrigerating Engineering. v. 34, no. 6. December, 1937. p. 367-368. Multitude of thermo-couples in a vacuum bulb absorb heat from sun and thus is produced electric current necessary for electrolysis.

Refrigerator Lockers.

Selling one locker storage job creates prospects for others. Air Conditioning and Refrigeration News. v. 22, no. 18. December 29, 1937. p. 10-11.

State regulations of cold storage locker plants. Ice and Refrigeration. v. 94, no. 2. p. 124. Outline of state laws applying to licensing and operation of cold storage locker plants. No specific regulations, but in many states they come under jurisdication of existing cold storage laws.

Research.

Civil Engineering Research. By S.C. Hollister. Engineering News-Record. v. 120, no. 6. February 10, 1938. p. 243-244. Extension of knowledge in soils, hydraulics and structures paralleled by development of practice.

Committee on research. American society of heating and ventilating engineers. Annual report - 1937. Heating, Piping and Air Conditioning. v. 10, no. 1. January, 1938. p. 77-84. Gives committee personnel.

Research at 1937 convention of Association of Land-Grant Colleges and Universities. Experiment Station Record. v. 78, no. 2. February, 1938. p. 145-149.

Rice.

When to cut rice. By W.D. Smith and Jenkin W. Jones. Washington, U.S. Govt. print. off., 1937. 5p. U.S. Department of Agriculture. Leaflet no. 148.

Roofs.

How to lay steel roofing; A practical handbook explaining and demonstrating pictorially the correct methods for laying sheet steel roofing. Chicago, Ill., Republic steel corporation. Agricultural extension bureau. 1937. 99p.

Water tightness of expansion joint materials in concrete roof construction. Washington, D.C., 1937. 7p. United States Department of Commerce. National Bureau of Standards. Technical information on building materials for use in the design of low-cost housing. TIBM - 55. Mimeographed.

Soil Mechanics.

Practical application of soil mechanics. A symposium: Discussion. By S.C. Hollister, T.T. Knappen and L.F. Harza. Proceedings of American Society of Civil Engineers. v. 63, no. 9. November, 1937. p. 1829-1834.

Soil Mechanics. (Cont'd)

Practical application of soil mechanics. A symposium: Discussion. By Richard M. Strohl and others. American Society of Civil Engineers. Proceedings. v. 64, no. 1. January, 1938. p. 213-221.

Soils.

Developments in soil knowledge. By Glennon Gilboy. Engineering News-Record. v. 120, no. 6. February 10, 1938. p. 241-243. Knowledge of settlement, earth-dam design, compaction of embankments and yielding of dam foundations was advanced during the year.

Storage of Fruits and Vegetables.

Agricultural engineer offers information on building new farm fruit storage rooms. Air Conditioning and Refrigeration News. v. 23, no.2. January 12, 1938. p. 10 - 11. Tells some of considerations involved in building and equipping such storages.

Oregon cooperative builds world's largest refrigerated fruit storage. By J.A. Newton. Refrigerating Engineering. v. 35, no. 2. February, 1938. p. 101-102, 130.

Varieties of vegetables suitable for freezing. By W.T. Tapley. Ice and Refrigeration. v. 94, no. 2. February, 1938. p. 125-127. Importance of selecting the proper variety of vegetables to obtain best quality and appearance. List of varieties that proved especially suitable for freezing.

Sugar Cane.

Modernization of the cane sugar industry in South China. By Reginald H. King. Facts about Sugar. v. 32, no. 10. October, 1937. p.387-392. Kwangtung government's plan and its development.

Terracing.

My father invented it. By P.H. Mangum. Country Gentleman. v. 107, no. 11. November, 1937. p. 14, 73. Discussion of Mangum terrace.

Tires.

Effect of tire size on tractor efficiency. By R.H. Wileman. Agricultural Engineering. v. 19, no. 1. January, 1938. p. 27-28. Table 1. Two-plow tractor pulling two 16-inch bottom plows 8 inches deep. Table 2. Three-plow tractor pulling three 14 inch bottom plows 7 inches deep. Table 3. Seedbed preparation with two-plow tractor pulling 8 foot tandem disk and 10 foot spike-tooth harrow. Table 4. Seedbed preparation with three-plow tractor pulling 8 foot tandem disk and 10 foot spike-tooth harrow.

Rating tractor tires for performance. By J.W. Shields. Agricultural Engineering. v. 19, no. 1. January, 1938. p. 26. 33. In trying

Tires. (Cont'd)

to arrive at some logical method to follow in choosing proper tire equipment for tractors, author has formulated following requirements: 1. Tires should provide traction to handle, without excessive slippage the full power of the engine when it is operating in plow gear in average soil. 2. Average soil is considered as moist loam or other soil with a coefficient of traction of 0.5. For other than average soils, oversize or special tires should be used. 3. From horsepower of engine compute expected drawbar pull on plow, gear, making allowance for losses due to gears and rolling resistance. 4. Provide sufficient weight on tires to give desired drawbar pull. 5. Choose tire with carrying capacity for required load.

Some dynamometer tests of tracks and rubber. By W.A. Herper. Agricultural Engineering. v. 19, no. 1. January, 1938. p. 23-25. Based on principle that facts are essential for good designing and selling, many dynamometer tests have been made at the Caterpillar Tractor Company's proving grounds, and paper discusses certain phases of measured performances of tractors and wagons equipped with tracks and low-pressure pneumatic tires.

Tobacco.

Consumption and production of tobacco in Europe. By J.B. Hutson. Washington, D.C., U.S. Govt. print. off., 1937 115p. United States Department of Agriculture. Technical bulletin 587.

Tractors.

A-C's model B at $495 aims at a 4,000,000 farm market. Implement & Tractor. v. 53, no. 3. February 5, 1938. p. 18-19, 46.

All tractor records broken in '37. Implement & Tractor. v. 53, no. 3. February 5, 1938. p. 16-17. Table gives manufacture and sale of tractors, combines, and gain threshers, 1937 and 1936.

Allis-Chalmers' tractor for small farms. Farm Machinery & Equipment. no. 1849. January 15, 1938. p. 20, 24. Low price of Model "B" offers serious threat to horse population. Immense potential market.

Cooperative tractor catalog. 22d annual edition, 1937-1938. Kansas City, Mo. Implement and tractor trade journal, 1937. 328p.

Farm tractor on parade. By Ralph W. Poulton. Breeder's Gazette. v. 102, no. 12. December, 1937. p. 16-17, 19.

The 500-dollar tractor's here - on rubber. Farm Implement News. v. 58, no. 26. December 30, 1937. p. 26-27.

More streamlining for Oliver tractors. Farm Machinery and Equipment. no. 1847. November 15, 1937. p. 22.